Assessment of the health system to support tuberculosis and AIDS care. A study of three rural health districts of Burkina Faso

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Abstract

There is increasing evidence demonstrating the importance of healthcare systems for improvement of chronic illness care. The aims of this study were to develop a comprehensive assessment of the health services capacity to provide tuberculosis (TB) and human immunodeficiency virus (HIV) care but also to enhance patient empowerment, social network and community support. A cross-sectional study was conducted from 1 to 31 of August 2007 in 3 districts of Burkina Faso. We used a step-by-step model and the assessment of chronic illness care (ACIC) scale to assess capacities of 24 first line health centres (FLHC) and 3 district hospitals (DH) for providing TB and HIV/AIDS care. Data for the step-by-step model were extracted from medical records of 75 TB and 66 HIV patients. The ACIC scale was completed by health professionals, 6 medical doctors and 18 nurses, working at the DH level and at the FLHC level, respectively. The biological test for confirmation was free of charge for all the TB patients but only for 10.6% (7/66) HIV cases. Up to the time of the survey, 5 TB (6.6%) and 18 HIV+ patients (27.3%) have been hospitalised for care at least once, 64 TB (85.3%) had been declared cured and 38 HIV (54.5%) were under antiretroviral treatment. Health care process organisation for TB and HIV care had distinct areas of weaknesses. From a maximum ACIC score of 11, the overall score for TB care ranged between 1.9 and 4.9 with a median of 3.7 and for HIV care between 2.1 and 6.7 with a median of 4.1. This study provides an illustration of assessing the HIV and TB care combining data from the routine information system and from the chronic illness care assessment tool, to encompass both disease control and patient health perspective. It provides to health managers arguments for clear conclusions and sufficient data for action.

Introduction

Tuberculosis (TB) and human immunodeficiency virus (HIV) are leading causes of death with profound economic effects in developing countries, particularly in Africa.[1,2]

Improvement in the control at both epidemics has gone through an improved process of program implementation. One can't deny efforts done for TB and HIV-AIDS at international level. However, there is still a lot of room for improvement.

First, TB and HIV-AIDS programs may have to further widen their scope in international policies design. Indeed, the new Stop TB strategy is still largely based on DOTS[3] and efforts aimed at controlling HIV/AIDS have mainly focused on prevention and the implementation of antiretroviral therapy.[4]

Secondly, although this has become a serious concern during the last decade[5] more attention should be given to the needs of patients living with or at risk for both diseases in the care process design and implementation. This should include particularly the many interactions between TB and HIV infection.[6]

Thirdly, special attention should be given to the role of the formal health care system, social networks, community, and patients in order to address the above issues. In relation to the formal health care system, co-infected TB-HIV patients are too often confronted with barriers to access to care because of the lack of coordination between both HIV and TB control programs.[7-9] For example, the TB and/or HIV diagnosis in Malawi requires repeated visits, long queues and delays in sending results, making poor the women and men's ability to access and adhere to services.[10] Besides the formal health care system, the social support system and the community at large are more and more recognized as important factors in assisting patients towards their journey to cure. Their role includes providing psychosocial or economical assistance to TB and HIV patients.[11]

Finally, the empowerment, particularly of TB patients appears still too often neglected by care providers as a determinant to timely access to diagnosis and treatment.[12] As a whole, more attention should be given in sub-Saharan to the role that the formal care delivery systems (public and private) should play in providing coordinated care to TB and HIV patients but also in enhancing social networks, community support and patient empowerment.[13] A point of special importance to improve implementation of both TB and HIV programs is to develop assessment tools, taking into account the above issues. This should help local managers and care providers in improving the care process for people affected by TB and/or HIV-AIDS. This article reports a cross-sectional assessment of the functional and organisational capacity of health services to provide TB and HIV-AIDS care in three health districts of Burkina Faso. It used a step-by-step model and the assessment of chronic illness care (ACIC, Version 3.5) scale.

Burkina Faso is a low-income country in West Africa with 11,500,000 inhabitants.[14] In 2005 the annual risk infection of TB (ARI) was 1.5, and the expected rate of new cases 60/100,000 inhabitants.[15] The prevalence of HIV was 4.2% in 2003. The health care system is organised into 64 Health Districts, made of first-line health centres (FLHC) network and a referring district hospital (DH). The FLHC (the entry point into the system) is close to the people and run by 2 nurses providing both curative and preventive care. The DH provides first referral care (medicine and surgery) performed by 2 medical doctors and 8 to 10 nurses. Eleven regional hospitals and three national hospitals serve, respectively, as the second and third referral levels.

Materials and Methods

Study design, setting and selection of participating health centres

This cross-sectional study was conducted from 1 to 31 August 2007 in three health districts of Burkina Faso (Ziniaré, Zorgho and Boussé) covering together 769,345 inhabitants with 63 first line health centres (FLHC) and 3 district hospitals (DH). In each health district the HD and 8 FLHC randomly selected were included in the study. The sample size of 8 FLHC took into account the financial and human capacity of the study. Then after listing and numbering all FLHC "N", we divided N by 8 to get the "n". The first centre to be included was chosen between number 1 and number 9 "a". The further FLHC were identified by systematically adding "n" to the first number "a".

It gave *a, a+n, a+2n, a+3n, a+4n*, etc.

In each DH the doctors involved in TB and/or HIV care were included in the study. In each FLHC the head of the centre and his substitute were included in the study.

Classically, TB and HIV cases that are suspected at FLHC are referred to the district hospital (DH) for investigation and confirmation. Once diagnosis is confirmed and the treatment decided, patients are referred back to FLHC for the follow up of their treatment.

All confirmed TB cases are put on 8 months of treatment (E=Ethambutol, H=Isoniazid, R=Rifampicin, Z=Pyrazinamid. The number before the letters indicate the duration in months of the treatment phase [2EHRZ, 6EH]). During the 2 first months of treatment, a care provider at the DH or FLHC supervises drug intake, and the remaining 6 months, TB patients collect their drugs weekly. Patient who still have a positive sputum smear at the end of the second month of treatment continue on EHRZ for a month and undergo another sputum smear test at the end of the third month. After that, whatever the result, the patient moves to the continuation phase of treatment (6EH). The HIV patients are divided into two groups. The first represents pregnant women who are HIV-positive, detected during antenatal care at the DH or the FLHC. To prevent the mother-to-child transmission, HIV-positive pregnant women are put on treatment up to delivery (Zidovudin 300 mg x 2/day starting the 28th week). The second group represents HIV-positive (men and women) with a low rate of CD4 (<200 CD4/μL); they are prescribed a continuous tri-therapy treatment (example: Niverapin® + Zidovudin® + Stavudin®).

Tools for assessment and data collection

First we analyzed the process of care for TB and HIV through a step-by-step model, previously used in TB program evaluation,[14] which includes the 4 usual steps: i) case suspicion; ii) case confirmation; iii) case management and iv) treatment outcomes. For each of the steps, we assessed performances of key activities for diagnosis and treatment. These activities included case suspicion, case referral, case confirmation, drug delivery, and patient follow up. We considered that an activity had been provided if there was appropriate information within the studied period. The data for each variable of different steps of TB and HIV care was expressed as a percentage of the total cases assessed.

Data sources were all the medical records of the cases detected and managed in the 3 health districts from January, 2004 to December 31, 2006. The medical records included consultation and hospitalisation registers and tools for the treatment follow up.

Secondly, we used the assessment of chronic illness care (ACIC, Version 3.5, http://www.improvingchroniccare.org/ACIC%20docs/ACIC_V3.5.pdf) scale, to assess the organisation of the district health care system to provide care support, especially for patients with tuberculosis and AIDS in a chronic illness care perspective. The ACIC was translated from English to French to facilitate its use in the local setting. This tool uses an 11 liker scoring system to assess six components subdivided in a series of items: health care organisation (3 items), community linkages (4 items), self-management support (4 items), clinical decision support (3 items), clinical delivery system (9 items) and clinical information system (6 items). The scale includes a set of items to increase standardisation and reproducibility in scoring. For each item, the scores are categorised as: 0-2 (limited support); 3-5 (basic support); 6-8 (good support); and 9-11 (fully developed support). Medical doctors working in DH and nurses working in FLHC completed the ACIC scale. Respondents included in the study were requested to provide a justification for their score. The score and justification for each item were obtained individually. The average time to complete the scale was 2 h for each participant.

Statistical analysis

The individual scores did not show a normal distribution. So, non-parametric measures were used to describe ACIC results in terms of median and quartile range. The median for the three health districts was calculated for each component, and for the 6 components. Proportions were used to summarise data from TB and HIV files, and the Mantel-Haenszel or Yates N^2 was used to compare them with a precision threshold (alpha) of 5%.

Results

The records of 75 TB patients (28 females and 47 males) and 66 HIV patients (39 females and 27 males) were included in the study for the step-by-step assessment. The median age of participants was 35 years (min=16; max=47). Six medical doctors at DH and 18 nurses at FLHC responded to the questionnaire for the ACIC. The average duration at the work place for the doctors and nurses was 4 years (range 2-7).

Analysis of the process of care through the step-by-step model

Case suspicion

All TB patients (75/75) and 89.4% (57/66) HIV cases were detected passively, meaning that patients came spontaneously to health centres (FLHC or DH), and presented with symptoms expressed during curative consultation or during hospitalization. Some HIV cases (10.6%, 7/66) were detected during systematic clinical examination of targeted groups (pregnant women and sex workers). For 94.7% (71/75) of TB cases and 60.6% (40/66) of HIV cases, the suspicion criteria have been clearly defined. For suspected TB identification symptoms were "coughing more than two weeks" associated sometimes with associated haemoptysis and/or weight loss and/or appetite loss for tuberculosis. Notified symptoms for HIV were mainly the weight loss or cachexia associated with skin diseases. For 4 TB and 14 HIV diagnosed patients, we did not find any mention of warning symptoms in the patient record. These were mainly patients hospitalised at DH and pregnant women at ANC (Table 1).

Case confirmation

All 75 TB and 66 HIV cases were confirmed through biological test (Sputum examination for TB, Determine*/Western Blot* for HIV) and eventually additional specific tests (X-rays, Blood cell examination, etc.). From the 75 TB, 13 (17.3%) received counselling for HIV testing during the treatment of which ten agreed to be tested and 5 were HIV positive (50%). During the 2 years, 13.6% (9/66) HIV cases had sputum examination and 33.3% (3/9) were confirmed TB and treated. No case was diagnosed on clinical examination basis only. The biological tests were free for all the TB cases (75/75) and for only 10.6% of the HIV cases (7/66). All 7 HIV cases were pregnant women benefiting from the mother and child transmission program (MCTP) (Table 1).

Case management

Five TB (6.6%) and 18 HIV (27.3%) patients were hospitalised for care at least once during the study period. The remaining ones, 70 TB and 48 HIV, were treated as outpatients (Table 1).

Treatment outcomes

Up to the time of the survey, 16 TB patients (21.1%) and 26 HIV patients (39.4%) had discontinued the drug intake at least once; 64 TB patients (85.3%) had been declared cured (58 after 8 months and 6 after 10 to 12 months) and 38 HIV patients (54.5%) were on anti retroviral treatment. Six TB patients (8%) and 13 HIV patients (19.7%) died (Table 1).

ACIC scores for FLHCs and DHs

The overall ACIC score for TB care ranged between 1.9 and 4.9 with a median of 3.7 (basic support) and for HIV care between 2.1 and 6.7 with a median of 4.1 (basic support). Each system component of health care process organisation for TB and HIV care had distinct areas of strengths and weaknesses, as summarised below.

Organisational influence

Health professionals scored a median 3.6 for TB care and 3.9 for HIV care, both corresponding to a basic level of development. All the FLHC and DH included TB and HIV care goals in their yearly plan, but none had a coordinator for the two diseases. Financial resources are allocated yearly to DH and FLHC but funding is still vulnerable and not very flexible, targeting specific activities such as IEC and training of providers.

Training of nurses in TB and HIV management, developed in 2005 separately by the TB national program and HIV national program, were perceived by respondents as an improvement strategy for TB and HIV care. The majority of doctors and nurses, agreed that regular integrated supervisions, conducted twice a year, was not enough to motivate quality of care provision. Incentive funds were not available to support TB and HIV care.

Attempts were made to identify and report quality problems concerning only TB care during monitoring (2 time per year) but, follow-through was weak for monitoring sputum quality, patient and system delays and lost to follow up. None had confirmed an established continuous quality improvement program.

Community linkages

Professionals scored limited support for TB (median=1.9) and basic support for HIV (median=4.7).

For TB care, all respondent nurses reported going, some time, out into the community to train community health workers (CHW) in the follow up of treatment and the process for patients' home visits. No follow up of these activities was in place.

For HIV, the 6 doctors reported that the three DHs worked together with 23 community based organisations (CBO) to run community-based programs such as 'Home visits' or 'Positive behaviour promotion'. However, all respondents mentioned that community involvement in HIV care, needed to be better organised. Frequently, CBO worked separately and efforts were not coordinated among the CBO, with little supervision from care providers and, therefore, no quality assessment of their activities.

Self-management support

Health professionals scored a basic support for TB (median=3.7) and good for HIV (median=6.7).

TB patient education was most frequently delivered using the one-to-one approach or individual education.

For HIV, the one-to-one education was not the only strategy for self management support. The peer support and mentoring programs

Table 1. Results of auditing of medical records using the operational analysis model.

Steps	Variables	TB N=75%	VIH N=66%	P
Case suspicion	Passive detection (people has to come from their own reason to health care institution)	100	89.4	P<0.05
	Active detection in target groups (detection is systematic for pregnant women, school boys, soldiers, sex workers…)	0	10.6	
	Suspicion symptoms clearly defined	82.7	60,6	P<0.01
Case confirmation	Confirmation done after the only clinical examination	0	0	
	Confirmation done after biological positive tests	89	100	P<0.05
	Confirmation done after other tests (X ray, Blood cells examination, etc.)	11	0	
	Confirmation test paid by the patient	0	89.4	P<0.05
Case management	In-patient (patients hospitalised at least one time)	6.6	27.3	P<0.001
	Out patient	93.4	100	
Treatment outcomes				
	Patient not complying to treatment (patient stopping drug intake at least one time)	21.3	39.4	
	Patients declared «cured»	90.6	-	-
	Patient declared «stabilised»	-	54.5	-
	Patients dead	8	19.7	P<0.05

were organized for HIV through CBO and associations HIV positive, for people who are HIV positive in addition to the one-to-one education and counselling at the start of treatment. All HIV patients benefited from a self management programme. These activities were regularly financed, the feedback from CBO to care providers was systematic and reports were available at FLHC and DH.

Decision support

Health professionals scored a basic support for TB (median = 4.7) and for HIV (median = 4.2). Clinical guidelines were distributed to FLHC and DH, and supported by provider's education for TB and HIV.

From the TB suspicion to the drug intake, care providers had three guidelines (guideline for TB case management; guideline for sputum examination; guideline for the treatment follow up). Two guidelines were available for HIV care (HIV management guideline and antiretroviral therapy guideline). The heath providers had to complete 6 registers or forms for TB management (register for sputum/smear; form for asking the sputum examination; form for sending sputum/smear to laboratory; referral and counter referral form of chronic coughers; register of TB patients; TB treatment follow up form). They had to complete 5 files for HIV management (register for new clients of voluntary counselling and testing; individual consent form; form for the adviser in charge of VCT; referral and counter referral form; form for the assessment of the patient satisfaction; register for patients in treatment; individual treatment follow up form).

Weaknesses and proposed solutions for registers use, as identified during supervisions and feedbacks were rarely documented. The involvement of specialists from regional hospitals in TB and HIV care was mainly through conventional referrals, and the contacts between specialists and workers at health centres were very rare.

Delivery system design

Professionals scored basic support for TB (median=4.9) and HIV (median=4.0).

Most FLHCs were perceived as suffering from a shortage of staff (an average 2 nurses/FLHC/12,212 inhabitants) and the two resident doctors for each DH were continuously overworked. All doctors reported functional systems for diagnosing, dispensing medication and reporting of TB and HIV cases in DH. However, most of the time, the referred suspected TB and HIV cases were delayed or did not come to DH in seeking care. Drug supplies were available at FLHC and DH for TB and only at DH for HIV (antiretroviral therapy).

Clinical information systems

Professionals scored a basic support for TB (median=3.3) and HIV (median=2.2).

According to respondents, DHs and FLHCs used only a paper-based information system for TB and HIV care. Easily accessible patient records with recall systems were available for TB in FLHCs and DHs and only in the DHs for HIV. Most information systems lacked the capacity to supply staff with population-based information on quality of TB and HIV care (Table 2).

Discussion

This study reports an assessment of the functional and organisational capacity of 3 Burkinabe health services to provide TB and HIV care and to enhance social network involvement, community support and patient empowerment. The findings are contextual (concerning the 3 HD) and can by no means be extrapolated for the whole country. This study should rather be considered as an illustration for a methodology, combining step-by-step model and ACIC scale. It fosters reflection on the interaction between TB and HIV care processes.

The usefulness of using together step-by-step model and assessment of chronic illness care tools for care organization assessment

TB and HIV care requires complex interventions incorporating many dimensions of diseases and patients. New tools of assessment to describe and understand the impact of care on patient outcomes are necessary. Combining the step-by-step approach and the ACIC integrates the disease control and biomedical aspects within the management of chronic conditions.[16]

The step-by-step model is useful because it forces one to review the whole care process in a disease control and biomedical perspective, starting with the initial symptoms and ending with the cure of the disease.[17] The principal quality criterion stressed by this model is the continuity of care that is given to people affected by a disease, through the various steps: suspected disease, confirmation, treatment and monitoring for the adherence. However, that model does not stress enough the relationship between care organization and the patient's psychosocial and economic problems, including the capacity of the health system to provide holistic and integrated care.[12] The ACIC tool fulfils these gaps. It assesses comprehensively several key factors of the care process for chronic illnesses, such as a multidisciplinary approach and community involvement; linkages between the health care organisation and community resources (and external service providers); effective self-management support; access to evidence-based information for patients-decision support; and individual information systems. The effects of all these factors on chronic diseases outcome have been widely documented.[18-20]

The comparison between tuberculosis and human immunodeficiency virus

Our study identified many aspects of the

Table 2. Results of the status of health care services to support tuberculosis and human immunodeficiency virus care.

ACIC components	Items measured	Median TB	Median HIV	Limited fully	Basic	Good
Organisational influence	Organisational commitment (goals) for chronic illness care; Improvement strategies for chronic illness care; Incentives (and regulations) for chronic illness care	3.2			x	
			3.6		x	
Community linkages	Linking patients to outside resources; partnerships and activities with community based organisations; working out in the community; coordination with other agencies;	4.7			x	
			1.9	x		
Self-management support	Assessment and documentation of self-management needs and activities; self-management education and support; addressing concerns of patients and families; effective behaviour change interventions	6.7				x
			3.7		x	
Clinical decision support	Evidence based guidelines; involvement of specialists in improving primary care; provider education for chronic illness care	4.2			x	
			4.7		x	
Delivery system design	Practice team functioning; leadership in chronic disease care; appointment system; follow up; planned visits for chronic illness care; continuity of care; client access/cultural competence issues; well functioning pathology system; well functioning pharmacy system	4.0			x	
			4.9		x	
Clinical information system	Register of community members (health centre population list); register of patients with specific conditions; reminders to providers; feedback; patient treatment plans; records and filing system	2.1			x	
			3.3		x	
Overall ACIC score		4.1			x	
			3.7		x	

care process that would benefit from a etter coordination between TB and HIV programs, but also more reflexion.

On the biomedical and disease control dimensions

Case identification is problematic. Because of the various difficulties in performing diagnostic tests, needs are different for TB and HIV. For TB, the first screening is vital given the relative difficulty in performing sputum examination. Although suspected symptoms are more clearly defined and easier to detect than HIV, the many false positives might induce unmanageable workload in laboratories.[21] For HIV, the diagnosis procedure is simpler, and therefore recognition of symptoms for screening becomes less important, particularly if HIV testing is free of charge.[22] However, a large scale HIV testing could also increase the workload of care providers and reduce the quality of care in

general.[23] Nevertheless, this might be an opportunity to detect more suspected of TB.[24]

As mentioned before, diagnoses strategies are different for both diseases in Burkina Faso. TB cases are detected exclusively at care centres (FLHC and DH) and the sputum examination for TB is free for all suspected cases. On the other hand, systematic HIV test within specific groups (sex workers, pregnant women) represent a significant additional opportunity to detect HIV. In our settings, HIV detection combines passive and systematic case detection within target groups. However, a significant proportion of HIV patients (more than 2/3) paid for testing.

In relation to case management, the proportion of patients hospitalised at least once, with the fees that it implies, is significantly higher for HIV than TB. A very little proportion of TB cases received HIV testing and vice versa.

As a whole, the issue of providing diagnostic

testing and treatment free of charge for HIV and/or TB should be addressed within the broader context of financial access to care for all health problems.

In a chronic care perspective

Using the ACIC score, development TB and HIV care support in the 3 health districts is basic. The more developed component is "Self-management support" in HIV care, where community based activities target effective behaviour change interventions and try to address concerns of patients and their families. There is considerable room for improvement in all care support system components. Relevant funding of health centres with more flexibility and more sustainability will certainly improve the care providers' work conditions and lead to better treatment outcomes.[25,26] Community linkages are lacking in TB care process and are poorly organized in the HIV care process. Rather than only involving community based associations, TB patients (cured and in treatment) who can provide peer and group support should be promoted, as already done for HIV.[12] In our context, HIV/AIDS and TB programmes have maintained their own management, supervision, and funding. It is essential for AIDS and TB control programmes managers to work together in order to combine their resources and alleviate the workload of care providers, for example by reducing the large amount of forms to be completed, or by merging tools for clinical information systems at DHs and FLHCs. This could contribute to improve drug supplies, the quality of supervisions and staff motivation.[11,12]

The self-management support, component of the programme is very weak, especially for TB. Counselling before starting treatment is not enough to establish an effective process for patient activation. Other strategies to empower patients should be explored especially involving patients' associations into the TB care management.[12]

Given that our FLHCs are staffed by nurses, a feasible approach to improve delivery system design is to assign and strengthen their roles in delivering routine care for TB and HIV patients, and to ensure effective referral systems to practitioners at district and regional hospitals.[12] The delegation of this task supported by regular supervision of medical doctors from DHs, could also improve the relative under-utilisation of FLHC by other patients with chronic conditions.

Link between the biomedical and disease control dimensions, and the chronic care perspective

As chronic diseases, TB and HIV care are not limited to the management of the biological aspects, but also to social aspects, as they have also an impact on the daily behaviour of patients at home and in workplaces.[27] The combined assessment of two chronic illnesses, such as TB and HIV, highlights the limitations of the care system and allows better planning and improvement in the care of all chronic patients. In such a perspective the step-by-step approaches combined with the ACIC becomes a strategic tool for regular evaluation of the quality and the performance of chronic illness care in a given setting.

Conclusions

This study provides an illustration of assessing HIV and TB care in an innovative way, emphasizing routinely collected data combined with the actor's experiences. It shows the usefulness of a combined step-by-step and chronic illness care assessment tool to encompass both disease control and patient health perspectives. With the proposed approach, chronic care support systems can quickly show health managers and policymakers the areas where the care system needs to be strengthened, and provides guidance for improving current care processes. We recommend first, a repetitive application of the combined tool for an ongoing monitoring and second, a more research to define the cause-effect relationship between health care systems and quality of chronic care using longitudinal study designs. Such studies may also help to clarify resource and management requirements for sustaining improvements in chronic illness care.

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